New Hampshire Climate Change Policy Task Force
Draft Action Reports under Development

New Actions under Consideration

Energy Generation and Use (EGU) Sector

Prepared by NHDES
October 20, 2008

Table of Contents

EGU Action 2.6 – Importation of Canadian Hydro and Wind Generation

Summary

To the extent that it reduces or does not raise electricity rates to the consumer, high voltage transmission lines should be built to import clean power generated from Canadian hydro and wind sources as a complimentary policy to developing non-carbon emitting generation in New Hampshire. Canada is developing vast new hydro and wind generation resources, which are greater than their local needs. This creates an opportunity for New Hampshire and the entire Northeast to obtain clean power. This could provide new power sources to offset future local and regional growth as well as curtail operation of higher cost, carbon emitting generation.

Program Description

1. Mechanism (*i.e., how the policy or program achieves the desired result*): By both developing contracts or commitments for Canadian power companies or brokers and building new high capacity transmission lines, clean power can be purchased and transmitted south from Canada. This concept is not new. In the 1980s, a high voltage transmission line was built from Canada to facilitate lower cost energy purchases and transmission to New England. The new clean power line(s) go beyond the capability of the existing system so new transmission is needed. However, this example illustrates that the concept has been achieved previously so it can be expanded and/or done again as part of developing relationships and business deals for the product, customers or buyers must also be aligned so the procurement deals can become reality.

   The costs of the project, including construction and transmission costs would be born in the delivery cost of the electricity to the New Hampshire customers. A primary cost approach to this project would be to have customers pay one rate for the energy and transmission of the power and this rate would need to be at or below market prices.

   This same requirement need not apply to potential parallel development of New Hampshire-based renewable generation, as potential increased costs should be considered in the context of the overall project benefits.

2. Implementation Plan (*i.e., how to implement the specific policy or program*)

   a. *Method of Establishment (e.g., legislation, executive order):* PUC orders and positive legislative support to clarify issues as needed.

   b. *Resources Required*: Program developers are needed to find and align sellers and buyers of this clean power. These agreements must be framed around the needed construction of a new high voltage transmission line(s) which would serve as a necessary conduit for power flow. A positive regulatory or legislative signal on this issue is very important.

   c. *Barriers to Address*: The barriers that New Hampshire needs to overcome are the state approvals needed to allow such a project to proceed. This includes PUC and/or legislative approvals to allow construction of a new transmission system. This signal will be the key catalyst to bring deals to closure.

3. Parties Affected by Implementation (*i.e., residents, businesses, municipalities, etc.*):
   a. *Parties Responsible for Implementation:* PUC and utilities or customers purchasing power from Canadian supplier, FERC and ISO-NE.

   b. *Parties Paying for Implementation*: Utilities and customers.
   c. *Parties Benefiting from Implementation*: All customers.

4. Related Existing Policies and Programs (*i.e., those that address similar issues without interacting*):

5. Complementary Policies (*i.e., those that achieve greater reductions through parallel implementation*):

   a. Existing
      - Regional Greenhouse Gas Initiative (RGGI)
      - Renewable Portfolio Standard (RPS)
   b. *Proposed*:
      - EGU Action 2.9 – Promote Low- and Non-CO_2-Emitting Distributed Generation

6. Timeframe for Implementation: Soon after 2012, depending on necessary review and approval steps.

7. Anticipated Timeframe of Outcome: Upon installation and successful testing.

<u>Program Evaluation</u>

Value analysis of electric rate change versus environmental benefit must be weighed for each program or project.

1. Estimated CO2 Emission Reduction

   a. (2012): 0 MMTCO2e

   b. (2025): 6.09 MMTCO2e

   c. (2050): 6.09 MMTCO2e

2. Economic Effects – ***Costs and Savings for this Action have not yet been completed.***
   a. Costs
      i. (2012):
      ii. (2025):
      iii. (2050):

   b. Savings ($)
      i. (2012):
      ii. (2025):
      iii. (2050):

3. Other Benefits/Impacts
   a. *Environmental*: Importation of renewable energy can reduce emissions of carbon dioxide and other greenhouse gases and primary air pollutants that contribute to climate change and damage our ecosystems. Emission reductions will directly improve air and water quality while indirectly benefitting the fish, wildlife, and ecosystems that depend on clean air and water. Additional environmental benefits would be gained by avoiding the

construction of supply-side resources in the New Hampshire. However, there are concerns about the impact of hydro power on methane generation in the reservoirs.

a. *Health:* Particulate matter and ozone precursors such as VOCs and NOx contribute to cardiac and respiratory ailments in humans and adversely affect the health of other living organisms. In particular, ozone formation increases dramatically during hot weather. Therefore, measures that mitigate climate warming by reducing harmful emissions will also be beneficial to the health of human populations and ecosystems in general.

b. *Social:* Programs that promote environmental sustainability by conserving natural resources and reducing emissions have immediate and long-term benefits to society. Increased public awareness arising from such programs will help to alleviate climate change. Programs involving energy conservation and some alternative generation technologies have relatively short payback periods. These programs bolster the local economy in a number of ways: they produce "green" jobs, free up money that can be reallocated to other purposes, and result in greater economic security overall.

c. *Other:*

4. Potential for Implementation (*i.e., including challenges, obstacles and opportunities*)

a. *Technical:* The technology exists to do this work. Lead time continues to lengthen due to current high global demand for this equipment.

b. *Economic:* This measure provides short term value in the form of wages.

c. *Statutory/Regulatory:*

d. *Social:* There may be resistance to allow siting of any new, larger power projects. This will may require significant effort to address concerns and develop the necessary support.

5. Other Factors of Note:

6. Level of Group Interest:

7. References:

- **ISO-NE Scenario Analysis Report**
Exploring the economic, reliability, and environmental impacts of various resource outcomes for meeting the region's future electricity needs
http://www.iso-ne.com/committees/comm_wkgrps/othr/sas/mtrls/elec_report/scenario_analysis_final.pdf

EGU Action 2.7 – Allow Regulated Utilities to Build Renewable Generation

Summary

To the extent that it increases New Hampshire's overall renewable energy capacity and the rate at which those resources are brought online, the State should provide regulated utilities with the authority to construct and/or acquire renewable generating asset. The only regulated electric utility that this action would apply to is Public Service of NH. As noted in the legislative history below, this issue has been an area of intense debate within the legislature and a wide range of opinions exist among the various stakeholder groups across the state. However, in the interest of reducing the State's greenhouse gas (GHG) emissions and reducing vulnerability to global energy price volatility, New Hampshire's energy planning efforts should consider (take advantage of) the significant resources and experiences that Public Service of New Hampshire can provide in the development of new renewable generation. The key element to achieve the GHG reductions is to provide clarifying legislation that gives PSNH the authority to construct and/or acquire renewable generating assets.

Program Description

Summary of Electric Generation Restructuring[1]

Revised Annotated Statutes (RSA) 374-F set forth the policy and implementation steps for restructuring New Hampshire's electric utility industry to a competitive market. Subsequent to enactment of RSA 374-F in 1996, the PUC ordered the electric utilities to divest their ownership interests in generation assets in order to eliminate any vertical market power. Electric utilities were to become primarily transmission and distribution companies. After protracted court battles between the utilities and the state on various issues related to restructuring, divestiture was agreed to, most notably in the negotiated PSNH Settlement Agreement as approved by the PUC in 2000. The Legislature, through passage of SB 472 in 2000, played a key role in enabling and setting forth important terms of the Settlement Agreement. In it, the Legislature directed that PSNH fossil generation assets be sold by July 1, 2001, "unless the PUC finds due to circumstances beyond its control that further delay is in the public interest."

In 2001, House Bill 489 was passed in reaction to the electric restructuring debacle that occurred in California during the prior summer and the increases in wholesale prices for electricity in New England. The 2001 legislation specified that PSNH's fossil and hydro assets could not be sold off any sooner than February 1, 2004, but that the PUC should expeditiously initiate and complete the sale of Seabrook to benefit customers' stranded cost recovery obligations. In addition, the legislation extended the availability of transition service for residential, commercial and industrial customers. In essence, the Legislature put a temporary brake on full divestiture of generation assets and created a safety net for electric consumers.

In 2003 the Legislature passed Senate Bill 170 (RSA 369-B:3-a) which specified that "the sale of PSNH fossil and hydro generation assets shall not take place before April 30, 2006. …..subsequent to April 30, 2006, PSNH may divest its generation assets if the commission finds that it is in the economic interest of retail customers of PSNH to do so, and provides for the cost recovery of such divestiture."

Senate Bill 170 provided that "prior to any divestiture of its generation assets, PSNH may modify or retire such generation assets if the commission finds that it is in the public interest of retail customers of

[1] This summary was based on a draft document, entitled "Legislative Policy on the Generation of Electricity", that was presented by Joel Anderson, House Committee Research Office, to the State Energy Policy Commission on October 25, 2006.

PSNH to do so, and provides for the cost recovery of such modification or retirement." In large part, this statutory language was added to allow PSNH to convert one of its coal boilers at Schiller to a wood-burning one.

It seems to be generally accepted that electric utilities can no longer build any new power plants of any significant size. Recent attempts have been made in the Legislature (which have failed) to enable utilities to do so once again. These attempts have triggered the policy debate on whether changes in the market, new supply needs, or other perceived public needs such as constructing a new wood-fired plant in the North Country, are best met by the private sector and competitive markets or by public utilities and regulated rates.

1. Mechanism (*i.e., how the policy or program achieves the desired result*):

Society needs to move away from carbon-based supply-side resources and transition towards generating facilities that are low- or non-CO_2-emitting. Although significant and increasing resources will be deployed to reduce electrical demand through greater energy efficiency, clean distributed generation and efficient co-generation projects, the current level of generating resources will be needed to bridge the transition from today's balance of supply and demand to a low-carbon emissions future. As efforts continue in improving efficiency and reducing demand, the overall strategic plan must also anticipate load growth. An additional, and reasonable, assumption is that certain fossil fuels will reduce in availability into the future based on limited supply or cost. As this occurs, energy prices will increase proportionately.

An important component of a core strategy to manage future energy costs is to diversify the supply mix and have less carbon-based supply facilities. This is accomplished by building low and non-carbon emitting generating facilities over the next five to ten years. These investments will assist in stabilizing rates into the future and be sound investments to meet increasing demands for carbon-free energy. These investments will also provide high value to the New Hampshire economy by material procurement and wages for local craftsmen. This, in turn, becomes a positive approach which benefits local town(s) and state economy. Finally, these plants will reduce future energy costs with savings returned to the customers.

New Hampshire's planning efforts should not overlook the significant resource Public Service of New Hampshire can provide in the development of new renewable generation. In order to utilize its experience and resources, barriers must be removed to allow low- and non-emitting generation technology to be built including clarifying the current NH law which addresses regulated generation's authority to construct or acquire generation. Regulated utilities should have the authority to provide their customers additional, new renewable generation while at the same time broadening the potential builders of renewable generation.

There is a critical need to address additional generation requirements with a portfolio of renewable generation, such as at least one 50 MW biomass plant, up to three 20-25 MW distributed generation units to help meet peak load requirements, up to 12 MW of photovoltaic (solar) cells, and up to six 24 MW wind projects. These efforts would complement increasing energy efficiency and demand-side programs while providing a balanced generation portfolio and keeping customers' best interests in mind. This approach adds more local, New Hampshire renewable generation, while supporting the regional effort to develop more renewable generation. Again, while addressing supply needs, it is imperative that electrical transmission capability within the state be enhanced and increased to support the development of new low- or non- CO_2-emitting generation.

2. Implementation Plan (*i.e., how to implement the specific policy or program*)

    a. *Method of Establishment (e.g., legislation, executive order)*

        i. Seek legislation to clarify a regulated utilities authority to construct and or acquire renewable generation.

        ii. Establish streamlined state and local permitting processes. Consider an expedited process for smaller generation facilities using renewable resources.

        iii. Provide for expedited PUC proceeding schedules when held prior to commencement of a project and construction

    b. *Resources Required*: NH Legislature, state government, PUC, NHDES, and local governing bodies must align support of such applications.

    c. *Barriers to Address*: Eliminate barriers for regulated utilities to construct new, clean generation.

        i. Establish clear legislation authorizing regulated utilities to construct or acquire renewable generation.

        ii. Address obstacles to speedy and efficient project review at the state and local levels.

        iii. Address transmission infrastructure limitations, including the Coos County loop in northern New Hampshire

3. Parties Affected by Implementation (*i.e., residents, businesses, municipalities, etc*.):

    a. *Parties Responsible for Implementation:* State legislature, NHDES, PUC, New Hampshire Site Evaluation Committee, and regulated utilities.

    b. *Parties Paying for Implementation:* Customers of the regulated utility would pay the cost to construct new generation facilities. Customers in New Hampshire and potentially throughout New England would pay for enhanced transmission;

    c. *Parties Benefiting from Implementation:* Customers of the utility would benefit from associated cost savings (e.g. lower compliance costs, avoidance of higher cost market purchases, etc.) All citizens would benefit from reduced CO2 emissions.

4. Related Existing Policies and Programs (*i.e., those that address similar issues without interacting*):

5. Complementary Policies (*i.e., those that achieve greater reductions through parallel implementation*):

    a. Enable the development of transmission resources in northern New Hampshire to facilitate renewable power transfers to southern New Hampshire. Also, transmission facilities should be installed to allow clean energy purchases. (See Senate Bill 383.)

b. Allow the deployment and installation of clean small scale distributed energy and heat producing generating facilities. (See Senate Bill 451.)

c. Evaluate the retention of existing nuclear power generation facilities into the future. This form of generation is considered in detail as a separate item (see EGU Action 2.5 – Nuclear Power Capacity).

6. Timeframe for Implementation: Begin in 2008 by passing appropriate legislation to clarify regulated generation's authority to build new generation.

7. Anticipated Timeframe of Outcome: Pass enabling legislation in 2009. Incent the construction of facilities to be on-line in support of New Hampshire's stated goal of a 25-percent reduction in carbon emissions by 2025 thus encouraging the development of -.

   a. 50 MW by 2012 - biomass
   b. 200 MW by 2025 – biomass, wind, and other
   c. 400 MW by 2050 – biomass, wind and other

<u>Program Evaluation</u>

Value analysis of electric rate change versus environmental benefit must be weighed for each program or project.

1. Estimated CO2 Emission Reduction –
   a. (2012): 0.14 MMTCO2e
   b. (2025): 0.56 MMTCO2e
   c. (2050): 1.12 MMTCO2e

2. Economic Effects – ***Costs and Savings for this Action have not yet been completed.***

A reasonable assumption is that certain carbon based fuels will reduce in availability into the future based on limited supply or cost. As this occurs, energy prices will increase proportionately. An important component of a core strategy to manage future energy costs is to diversify the supply mix and have less carbon-based supply facilities. This is accomplished by building low and non-carbon emitting generating facilities over the next five to ten years. These investments will assist in stabilizing rates into the future and be sound investments to meet increasing demands for carbon-free energy. These investments will also provide high value to the New Hampshire economy by material procurement and wages for local craftsmen. This, in turn, becomes a positive approach which benefits local town(s) and state economy. Finally, these plants will reduce future energy costs with savings returned to the customers.

   a. Costs
      i. (2012):
      ii. (2025):
      iii. (2050):

   b. Savings ($)
      i. (2012):
      ii. (2025):
      iii. (2050):

3. Other Benefits/Impacts
   a. *Environmental:* The proposed action will reduce emissions of carbon dioxide and other greenhouse gases and primary air pollutants that contribute to climate change and damage our ecosystems. Emission reductions will directly improve air and water quality while indirectly benefiting the fish, wildlife, and ecosystems that depend on clean air and water.

   b. *Health:* Particulate matter and ozone precursors such as VOCs and NOx contribute to cardiac and respiratory ailments in humans and adversely affect the health of other living organisms. In particular, ozone formation increases dramatically during hot weather. Therefore, measures that mitigate climate warming by reducing harmful emissions will also be beneficial to the health of human populations and ecosystems in general.

   c. *Social:* Programs that promote environmental sustainability by conserving natural resources and reducing emissions have immediate and long-term benefits to society. Increased public awareness arising from such programs will help to alleviate climate change. Programs involving energy conservation and some alternative generation technologies have relatively short payback periods. These programs bolster the local economy in a number of ways: they produce "green" jobs, free up money that can be reallocated to other purposes, and result in greater economic security overall.

   d. *Other:* Energy efficiency and emission reductions will reduce the load on our aging infrastructure and will create demand for alternative technologies in the U.S. marketplace.

4. Potential for Implementation (*i.e., including challenges, obstacles and opportunities*)
   a. *Technical:* Pending plans to construct facilities can be implemented relatively easily once siting and transmission policy issues are addressed.

   b. *Economic:* New facilities will create many construction jobs, long-term employment and tax revenue which will have a positive impact on the state's economy and will avoid fuel expenses being paid to other states and countries.

   c. *Statutory/Regulatory:* The Legislature and Commission has the authority to approve most needed changes. If NH attempts to socialize the costs of transmission improvements across New England, the ISO and/or FERC will need to be involved.

   d. *Social:* Increased energy efficiency provides a variety of societal benefits, including cleaner air and lower energy costs. The effectiveness of energy efficiency programs, and the degree to which the public embraces them, will depend on the details of their design and implementation.

5. Other Factors of Note:

6. Level of Group Interest:

7. References:

EGU Action 2.8 – Identify and Deploy the Next Generation of Electric Grid Technologies

Summary

In order to increase the efficiency of the grid and expand the integration of renewable distributed power generation to reduce total greenhouse gas emissions from the electric generation, the state of NH should work at the state and Regional level to facilitate the adoption of the next generation of electric grid standards, technologies, and practices through a *phased-in approach*. This transition will include the modernization of the electricity transmission and distribution system to incorporate digital information and controls technology, deployment of energy storage devices, and sharing of real-time pricing information with electricity customers and "smart" technologies in homes and businesses. Deployment of the technology and adoption of standards would occur in a step-wise fashion in which initial investments would first exploit the current most cost-effective technologies while more advanced technologies would be employed as they become more cost-effective. This transition would occur across New Hampshire and the entire ISO-NE grid to the point of general adoption and ongoing market support in the electric sector. Such action would lead to the creation of a self-monitoring, adaptive system capable of semi-automated restoration and higher energy efficiency through reduced line losses and better integration of renewable resources through energy storage capacity and the deployment of end use technologies that are able to shift electric use to times when renewable generation is greatest.

Program Description

1. Mechanism (*i.e., how the policy or program achieves the desired result*): The state of NH should work at the state and Regional level to facilitate the adoption of Smart Grid standards, technologies, and practices across New Hampshire and ISO-NE electricity grid to the modernize the electricity transmission and distribution system by:
   - Conducting programs to deploy advanced techniques for measuring peak load reductions and energy efficiency savings on customer premises from smart metering, demand response, distributed generation and electricity storage systems;
   - Establishing demonstration projects specifically focused on advanced technologies for power grid sensing, communications, analysis, and power flow control, including the integration of demand-side resources into grid management;
   - Requiring electric utilities, before undertaking investments in non-advanced grid technologies, to demonstrate that alternative investments in advanced grid technologies have been considered.
   - Requiring electric utility rates to: (1) align utility incentives with the delivery of cost-effective energy efficiency; and (2) promote energy efficiency investments;
   - Requiring all electricity purchasers to be provided direct access by their electricity provider to daily information regarding prices, usage, intervals and projections, and sources;
   - Requiring state regulatory authorities and non-regulated utilities to reconsider specified standards to take into account Smart Grid technologies;
   - Encouraging deployment and integration of renewable energy resources, both to the grid and on the customer side of the electric meter;
   - Deploying and integrating of advanced electricity storage and peak-sharing technologies, including plug-in electric and hybrid electric vehicles, and thermal-storage air conditioning; and
   - Providing consumers with new types of information and control options.

2. Implementation Plan (*i.e., how to implement the specific policy or program*)
   a. *Method of Establishment (e.g., legislation, executive order):* Assess the state of current Smart Grid technology market penetration and the identification of state, regional and national regulatory and institutional opportunities and obstacles related to Smart Grid development

and identify the necessary legislation, PUC orders and incentives required to initiate development.

b. *Resources Required:* Appropriate legislation and rules, government investment, and utility incentives and investment recovery mechanisms. Funding for initial development and expansion could come from the GHG Emissions Reduction Fund, funded by RGGI allowance auctions and administered by the NH PUC.

c. *Barriers to Address (especially for medium-to-low feasibility actions):* Expansion and replacement of transmission and distribution system can be extremely expensive.

3. Parties Affected by Implementation (*i.e., residents, businesses, municipalities, etc*.)
   a. *Parties Responsible for Implementation*: Legislature; PUC; OEP; DES; Energy Efficiency and Sustainable Energy Board; and utilities.
   b. *Parties Paying for Implementation*: Utilities and consumers.
   c. *Parties Benefiting from Implementation*: All consumers.

4. Related Existing Policies and Programs (*i.e., those that address similar issues without interacting*):

5. Complementary Policies (*i.e., those that achieve greater reductions through parallel implementation*)
   a. *Existing*:
      - Regional Greenhouse Gas Initiative (RGGI)
      - Renewable Portfolio Standard (RPS)
   b. *Proposed*:
      - EGU Action 2.9 – Promote Low- and Non-CO_2-Emitting Distributed Generation

6. Timeframe for Implementation: The technology required already exists and could be deployed within a year.

7. Anticipated Timeframe of Outcome: Time to total upgrade of the existing grid and expand into new areas in order to take advantage of renewable distributed generation could exceed a decade.

<u>Program Evaluation</u>

1. Estimated CO_2 Emission Reductions: The GHG reductions that result from this action would be realized through other initiatives. The Smart Grid supports RGGI and the RPS

2. Economic Effects – Not yet determined.
   a. Costs
      i. (2012):
      ii. (2025):
      iii. (2050):

   b. Savings ($)
      i. (2012):
      ii. (2025):
      iii. (2050):

3. Other Benefits/Impacts
   a. *Environmental:* Improvements in energy efficiency and expansion of renewables will reduce emissions of carbon dioxide and other greenhouse gases and primary air pollutants that contribute to climate change and damage our ecosystems. Emission reductions will directly

improve air and water quality while indirectly benefitting the fish, wildlife, and ecosystems that depend on clean air and water.

b. *Health:* Particulate matter and ozone precursors such as VOCs and NOx contribute to cardiac and respiratory ailments in humans and adversely affect the health of other living organisms. In particular, ozone formation increases dramatically during hot weather. Therefore, measures that mitigate climate warming by reducing harmful emissions will also be beneficial to the health of human populations and ecosystems in general.
c. *Social:* Programs that promote environmental sustainability by conserving natural resources and reducing emissions have immediate and long-term benefits to society. Increased public awareness arising from such programs will help to alleviate climate change. Programs involving energy conservation and some alternative generation technologies have relatively short payback periods. These programs bolster the local economy in a number of ways: they produce "green" jobs, free up money that can be reallocated to other purposes, and result in greater economic security overall.
d. *Other:* A Smart Grid is anticipated to reduce power outages and to localize their effect resulting in a reduction in economic impact and social disruption.

4. Potential for Implementation (*i.e., including challenges, obstacles, and opportunities*)
   a. *Technical*: Smart Grid technology already exists and can be installed immediately.
   b. *Economic*: Costs may be an issue for individual elements of a "smart grid" and will need to be phased in when economies of scale become applicable and the technologies become cost effective.
   c. *Statutory/Regulatory*: Legislation, PUC orders and revised regulations may need to be provided in order for advanced grid technologies to be deployed or deployed rapidly.
   d. *Social*:

5. Other Factors of Note: A Smart Grid has frequently been observed to be key to leveraging electric plug-in hybrid technology in order to reduce GHG emissions from the transp0ortation sector without causing a spike in peak load in the electric sector that would offset some or all of the transportation reductions depending on the energy source (e.g., coal vs. natural gas vs. renewables). With the development of a smart Grid, plug-in hybrids could be plugged into the grid and be programmed to charge when demand is lowest or when intermittent renewable generation such as wind is available.

6. Level of Group Interest: Developed at the request of the Climate Change Policy Task Force

7. References:

a. House Committee on Energy and Commerce
http://energycommerce.house.gov/energy_110/index.shtml
b. House Committee on Energy and Commerce – Committee Print - Transition to a Smart Grid
http://energycommerce.house.gov/cmte_mtgs/FC062707MU/ENBILL07_042_xml.pdf
c. House Committee on Energy and Commerce – Committee Print - Plug-in Hybrid Promotion
http://energycommerce.house.gov/cmte_mtgs/FC062707MU/ENBILL07_045_xml.pdf
d. Google's 'Smart Grid' idea? Get the govt to pay for it
http://www.theregister.co.uk/2008/09/19/google_ge_smart_grid_ploy/
e. H.R. 3237, The Smart Grid Facilitation Act of 2007
http://www.washingtonwatch.com/bills/show/110_HR_3237.html
f. Smart Grid Consortium to Develop Smart Grid City
http://www.greencarcongress.com/2008/01/smart-grid-cons.html

EGU Action 2.9 – Promote Low- and Non-CO_2-Emitting Distributed Generation

Summary

The State should encourage the development of customer-sited low- and non-CO_2-emitting distributed generation (DG) through a combination of regulatory changes and incentives. These distributed generation resources can include renewables such as solar photovoltaic systems, wind power systems, biogas and landfill gas-fired systems, geothermal generation systems, and systems fueled with biomass, as well as extremely efficient fossil fuel fired cogeneration or combined heat and power (CHP). The distributed electricity generating systems provide electricity system benefits such as avoided capital investment and avoided transmission and distribution losses, while also displacing fossil-fueled generation and thus reducing greenhouse gas emissions. Policies to encourage and accelerate the implementation of customer-sited renewable distributed generation include direct incentives for system purchase, market incentives—including "net metering", education, state goals or directives, and favorable rules for interconnecting renewable generation systems with the electricity grid.

Program Description

1. Mechanism (*i.e., how the policy or program achieves the desired result*):
Distributed generation sited at residences and commercial and industrial facilities, and powered by low- and non-CO_2-emitting energy sources, provides electricity system benefits and displaces fossil-fueled generation, and therefore reducing greenhouse gas emissions.

Distributed generation networks allow for relatively large numbers of electric generation sites to be deployed on the grid. DG is therefore much less susceptible to large-scale power outages caused by natural or the increasing number of manmade disasters that threaten national security. It reduces the amount of energy lost in transmitting electricity because the electricity is generated very near where it is used, perhaps even in the same building. This also reduces the size and number of power lines that must be constructed. Diesel engines have long been used as distributed power sources to provide emergency back-up power to industry and emergency services. However, even newer DG units have GHG emissions that are significantly higher than power plants that burn cleaner fuels or have emission controls. Although there are state regulations (e.g., NH Code of Administrative Rules Chapter Env-A 3700 NOx Emissions Reduction Fund for NOx-Emitting Generation Sources[2]) that encourage installation of emission controls on diesel engines, these controls do not address GHG emissions.

The use of alternative technologies need to be encouraged as a method for meeting demand for distributed power and can include solar photovoltaic systems, wind power systems, biogas and landfill gas-fired systems, geothermal generation systems, cogeneration or combined heat and power (CHP) and systems fueled with biomass. Increasing the use of renewable distributed generation in New Hampshire can be achieved through a combination of regulatory changes and incentives including:

- Training and education programs and certification for building planners, builders/contractors, energy managers and operators, renewable energy contractors, and state and local officials on the incorporation of distributed renewable generation and solar space/water heat in building projects;
- Assistance in siting, designing, planning renewable systems;
- Funding mechanisms and incentives could include low-interest loans, rebates on capital costs, tax incentives, and attractive rates for power purchases/net metering;

[2] Administrative Rules can be found at the NH Department of Environmental Services Website, see http://www.des.state.nh.us/.

- The development of interconnection standards to facilitate DG installation;
- Net metering for some renewable distributed generation, and possibly avoided-cost pricing rules for others;
- Net metering standards for highly efficient fossil fuel-fired cogeneration systems
- Pilots and demos, such as renewable systems in government buildings; and
- Research to identify the distributed renewable generation systems most suited to New Hampshire or its regions.

2. Implementation Plan (*i.e., how to implement the specific policy or program*)
   a. *Method of Establishment (e.g., legislation, executive order):* Assess the utilization of low CO_2e-emitting and renewable distributed generation in the state and the identification of regulatory and institutional opportunities and obstacles related to expansion of this network and identify the necessary legislation, PUC orders and incentives required to initiate development.
   b. *Resources Required:* Appropriate legislation and rules, funding and incentives. Funding could come from the Renewable Energy Fund, funded by Alternative Compliance Payments, and the Greenhouse Gas Emissions Reduction Fund, funded by RGGI allowance auctions. Both funds are administered by the NH PUC.
   c. *Barriers to Address (especially for medium-to-low feasibility actions):* Existing Net-Metering rules in New Hampshire may preclude the integration of facilities that elect to install co-generation technology if the primary fuel is a fossil fuel. Other barriers may include: commercialization barriers; price distortions; failure of the market to value the public benefits of renewables; failure of the market to value the social cost of fossil fuel technologies; and market barriers such as inadequate information, institutional barriers, high transaction costs because of small projects, high financing costs because of lender unfamiliarity and perceived risk, and "split incentives" between building owners and tenants.

3. Parties Affected by Implementation (*i.e., residents, businesses, municipalities, etc*.)
   a. *Parties Responsible for Implementation*: Legislature; PUC; OEP; DES; Energy Efficiency and Sustainable Energy Board; and utilities.
   b. *Parties Paying for Implementation*: Utilities and consumers.
   c. *Parties Benefiting from Implementation*: All consumers.

4. Related Existing Policies and Programs (*i.e., those that address similar issues without interacting*):
5. Complementary Policies (*i.e., those that achieve greater reductions through parallel implementation*)
   a. *Existing*:
      - EGU Action 2.1 - The Renewable Portfolio Standard
      - EGU Action 2.4 - The Regional Greenhouse Gas Initiative
      - NH Senate Bill 451
   b. *Proposed*:
      - EGU Action 2.8 – Identify and Deploy the Next Generation of Electric Grid Technologies

6. Timeframe for Implementation: The technology required already exists and is being implemented. An expanded rate of implementation could occur as soon as the necessary incentives and regulations are put in place.

7. Anticipated Timeframe of Outcome: The time required to fully take advantage of the existing and future opportunities may depend on the construction of a Smart Grid which will better integrate renewable energy generation through energy storage and smart technologies and real-time pricing communication.

Program Evaluation

1. Estimated CO_2 Emission Reductions: The GHG reductions that result from this action would be realized through other initiatives. The promotion of low CO_2e-emitting and renewable distributed generation supports RGGI and possible RECs[3].

2. Economic Effects
   a. Costs
      i. Implementation Cost:
      ii. Timing:
      iii. Impacts:

   b. Savings:

3. Other Benefits/Impacts
   a. *Environmental:* Improvements in energy efficiency will reduce emissions of carbon dioxide and other greenhouse gases and primary air pollutants that contribute to climate change and damage our ecosystems. Emission reductions will directly improve air and water quality while indirectly benefitting the fish, wildlife, and ecosystems that depend on clean air and water. Expanded distrubuted generation could result in a reduction in water consumption at central-station power plant for cooling.
   b. *Health:* Particulate matter and ozone precursors such as VOCs and NOx contribute to cardiac and respiratory ailments in humans and adversely affect the health of other living organisms. In particular, ozone formation increases dramatically during hot weather. Therefore, measures that mitigate climate warming by reducing harmful emissions will also be beneficial to the health of human populations and ecosystems in general.
   c. *Social:* Increased flexibility of electricity supply for consumers hosting generation. Programs that promote environmental sustainability by conserving natural resources and reducing emissions have immediate and long-term benefits to society. Increased public awareness arising from such programs will help to alleviate climate change. Programs involving energy conservation and some alternative generation technologies have relatively short payback periods. These programs bolster the local economy in a number of ways: they produce "green" jobs, free up money that can be reallocated to other purposes, and result in greater economic security overall.
   d. *Other:* Utility economic benefits also include loss reduction, reduced capital and operating costs, expanded generation capacity, distribution and transmission capacity investment deferral, reducing risk from uncertain fuel prices, green pricing benefits, etc.[C1] With the appropriate policies in place renewable DG also offers a new income stream. Electricity (grid) system benefits also include reduced peak demand, improved utilization and performance of the electricity system.

---

[3] Individuals at the Public Listening Sessions in September 2008 wondered whether several small-scale renewable generators could combine their generation to qualify for RECs under the existing RPS.

4. Potential for Implementation (*i.e., including challenges, obstacles, and opportunities*)
    a. *Technical*:
    b. *Economic*:
    c. *Statutory/Regulatory*:
    d. *Social*:

5. Other Factors of Note: Revenue decoupling must be combined with incentives for utilities to place greater emphasis on energy efficiency activities if the full benefits of decoupling are to be realized. California has had revenue decoupling in place for most of the past 25 years. There, the decoupling mechanism is generally accepted as a way to make the state's electric utilities indifferent to sales levels. Decoupling has had only small impacts on rate volatility. Analyzing ten years' worth of decoupling data, a 1994 U.C. Berkeley study concluded that "decoupling has had a negligible effect on rate levels and has, for [one of the three utilities analyzed], actually reduced rate volatility."[4]

6. Level of Group Interest: Developed at the request of the Climate Change Policy Task Force.

7. References:
    - *NH Senate Bill 451*
      AN ACT authorizing rate recovery for electric public utilities investments in distributed energy resources.
      http://www.gencourt.state.nh.us/legislation/2008/SB0451.html

[4] Joseph Eto, Steven Soft, and Timothy Belden, *The Theory and Practice of Decoupling*, Lawrence Berkeley Laboratory, University of California, January 1994, Report LBL-34555, UC-350 at 46. The cited excerpt of this report is attached hereto as Ex. A. The full report has been filed electronically, and is on file with ENE and available upon request.